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INSTITUTE OF ACTUARIES.

ANNUAL EXAMINATIONS.

The examinations for the present year have been fairly attended. At the matriculation, five candidates have presented themselves; and, for the second and third year, four and two respectively. We hope to publish, in the next number of the *Journal*, the names of the candidates, and the order of merit. We append a few of the questions, for the consideration of future candidates:—

FIRST YEAR.

1. Simplify $\frac{1}{13} \cdot \frac{\frac{2}{3} + \frac{4}{7}}{\frac{3}{2} - \frac{4}{7}} - \left[\frac{3}{4} + \frac{5}{6} - 2 \left(\frac{3}{8} - \frac{1}{12} \right) \right]$.
5. Given $\log. 2 = .301030$, and $\log. 3 = .477121$; find $\log. 6$ and $\log. 24$.
12. Investigate a formula for the summation of an arithmetical series.
13. Sum the series $\frac{2}{3} + \frac{3}{5} + \left(\frac{2}{3}\right)^2 + \left(\frac{3}{5}\right)^2 + \left(\frac{2}{3}\right)^3 + \left(\frac{3}{5}\right)^3 + \dots$, to infinity.
17. How many permutations can be made of the letters in the word "assurance"?
20. Find the middle term of the expansion of $(1+x)^6$.
23. How does Euclid define a straight line? Give a more satisfactory definition than his, proving the definition you enunciate by means of one of the Propositions of the First Book of Euclid.

SECOND YEAR.

1. Assuming the common series for $\log. (1+x)$, deduce a convenient practical formula for calculating logarithms.
Explain the process of calculating a table of common logarithms.
2. Prove that $\log_{10} N = \log_{10} e \cdot \log_e N$, where e is the base of the Napierian logarithms; also, that $\log_e 10 \cdot \log_{10} e = 1$.
4. A single die is thrown twice; what is the probability of the sum of the two numbers thrown being 9?
11. Out of 1,000 persons living at the age of 40, how many will survive to 60 according to De Moivre's hypothesis?
21. Prove the formula for the endowment of a life m , at the age $m+n$, with return of premiums in case of previous death.

$$\frac{D_{m+n}}{N_{m-1} + R_{m+n} + nM_{m+n} - N_{m+n-1} - R_m}.$$

25. Prove the formula for the value of an annuity $\frac{1}{p+d} - 1$, supposing the purchaser to obtain a given rate of interest, besides insuring the life to secure return of his capital.

THIRD YEAR.

2. Give a brief account of the way in which the reserve for the liability is determined in the Equitable Society.

3. State the conditions which must obtain in order that the reserve so determined shall prove sufficient, and no more than sufficient.

5. What is meant by "limited liability," as applied to Life Assurance Companies; and how does it operate in a Mutual Life Assurance Society?

11. It is desired to estimate the progress, in wealth and population, of a recently-settled district: what returns would you consider best calculated to afford information for such a purpose?

16. Supposing a general property-tax to be established, how would you recommend that it should apply to professional incomes and to incomes for life?

17. Can the Bank of England increase the circulation at pleasure; and if so, in what way?

PROCEEDINGS OF THE INSTITUTE.

Adjourned Annual General Meeting, Saturday, 15th October, 1859.

CHARLES JELlicoe, Vice-President, in the Chair.

The circular convening the meeting was read, and the minutes of the annual general meeting of the 4th June, 1859, were read and confirmed.

A special Report from the Council, and also a Report from the Auditors, were then read. From the former it appeared that the funds of the Institute amounted at the time to £452. 18s. The latter was as follows:—

"AUDITORS' REPORT.

"Gentlemen,—We beg to report that we have compared the list of Members marked A, with the counterparts of the receipts given to Members for their subscriptions, and also with the entries on the credit side of the Cash-Book, and we find that the total income of the Institute, from ordinary subscriptions, for the Session 1858-9, was £360. 3s., subject to a deduction on account of certain subscriptions not paid at the date of the balance. The list marked B gives the particulars of these subscriptions unpaid, viz., £35. 14s.

"We have also examined the vouchers for current expenses, which are all complete and in order, and we find the total amount of the expenses for last Session to have been £305. 7s. 7d.

"We beg to recommend that a Journal and Ledger be added to the Cash-Book now used, because we consider that a mere classification of cash payments affords few tests of accuracy. We further recommend, that the list of Members marked A be subject every year to revision.

"C. CHILD,
J. B. HAYCRAFT, } *Auditors.*
C. WATKINS,

"29th August, 1859."

An abstract of receipts and payments, to the 30th June, 1859, was then read, and it was resolved unanimously—"That the special Report of the Council, together with the Report of the Auditors, and the abstract of receipts and payments, be adopted, and entered on the Minutes."

The meeting then adjourned.

First Ordinary Meeting, Session 1859-60.—Monday, 28th November, 1859.

W. B. HODGE, Vice-President, in the Chair.

The minutes of the adjourned general meeting were read and confirmed.

The Secretary announced several donations to the library.

Several candidates for election at the next meeting were nominated.

A paper was read "On the rationale of certain actuarial estimates," by Charles Jellicoe, Vice-President.

Thanks having been voted to Mr. Jellicoe, the meeting adjourned to Monday, the 2nd January, 1860.